



- 1. A smoking composition comprising a smokable material, a plurality of metallic or carbonaceous catalytic particles having a mean average or a mode average particle size of less than about 20 microns, and a nitrate or nitrite source.
- 2. The composition of claim 1 wherein the smokable material comprises tobacco.
- 3. The composition of claim 1 wherein the tobacco has a reduced or a negligible nicotine content.
- 4. The composition of claim 1 wherein the tobacco has a reduced or a negligible content of one or more tobacco-specific nitrosamines.
- 5. The composition of claim 1 wherein the mean average particle size of the catalytic particles is about 15 μm or less.
- 6. The composition of claim 5 wherein the mean average particle size as measured by light scattering of the catalytic particles is from about 4 μ m to about 15 μ m.
- 7. The composition of claim 1 wherein the mode average particle size as measured by light scattering of the catalytic particles is about 15 µm or less.
- 8. The composition of claim 7 wherein the mode average particle size of the catalytic particles is from about 6 µm to about 13 µm.
- 9. The composition of claim 1 wherein the catalytic particles comprise at least one noble metal.
- 10. The composition of claim 1 wherein the at least one noble metal comprises palladium.
- 11. The composition of claim 10, wherein said catalytic particles comprise crystalline palladium particles of less than 1 μ m in diameter as measured by X-ray diffraction.
- 12. The composition of claim 10, wherein said catalytic particles comprise crystalline palladium particles of from about 50 nm to about 200 nm in average diameter.
- 13. The composition of claim 1 wherein the palladium is derived from ammonium tetrachloropalladate.

10

5

15

20

30



5

10

- 14. The composition of claim 1 wherein the smoking composition comprises from about 500 ppm to about 1500 ppm metal or carbon in a form of catalytic particles.
- 15. The composition of claim 14 wherein the smoking composition comprises from about 700 ppm to about 1000 ppm metal or carbon in the form of catalytic particles.
- 16. The composition of claim 14 wherein the smoking composition comprises about 800 ppm metal or carbon in the form of catalytic particles.
- 17. The composition of claim 1 wherein the nitrate or nitrite source comprises a nitrate or nitrite salt.
- 18. The composition of claim 17 wherein the nitrate salt comprises $Mg(NO_3)_2$ -6H₂O.
- 19. The composition of claim 1 wherein the smoking composition comprises from about 0.4 wt. % to about 1.5 wt. % nitrogen in the form of nitrate or nitrite.
- 20. The composition of claim 1 wherein the smoking composition comprises from about 0.6 wt. % to about 1.1 wt. % nitrogen in the form of nitrate or nitrite.
- 21. The composition of claim 1 wherein the smoking composition comprises about 0.9 wt. % nitrogen in the form of nitrate or nitrite.
- 22. The composition of claim 1, wherein the smoking composition further comprises a cavity filter, wherein the cavity filter is substatially filled with an active carbon or active charcoal.
- 23. The composition of claim 22, wherein the cavity filter is approximately 100 vol. % filled with an active carbon or active charcoal.
- A method of making a smoking composition that comprises a smokable material and exhibits a reduction in at least one undesirable component arising from pyrolytic reactions of the smokable material, said method comprising the steps of:

providing said smokable material;

applying a plurality of metallic or carbonaceous catalytic particles having a mean average or a mode average particle size of less than about 20 microns to the smokable material;

applying a nitrate or nitrite source to the smokable material, before, after or simultaneously with applying the plurality of particles; and

25

forming the smokable material into the smoking composition.

- 25. The method of claim 24 wherein the undesirable component comprises a polyaromatic hydrocarbon.
- 26. The method of claim 24 wherein the undesirable component comprises a tobacco-specific nitrosamine.
- 27. The method of claim 26 wherein the tobacco-specific nitrosamine comprises 4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone.
- 28. The method of claim 24 wherein the undesirable component comprises an azaarene.
- 29. The method of claim 24 wherein the undesirable component comprises carbazole.
- 30. The method of claim 24 wherein the undesirable component comprises a phenolic compound.
- 31. The method of claim 30 wherein the phenolic compound comprises phenol or catechol.
- 32. A method of smoking a smoking composition with reduced exposure to a carcinogenic substance, the carcinogenic substance arising from pyrolytic reactions of a smokable material contained within the smoking composition, the method comprising the steps of:

providing the smoking composition, the smoking composition comprising said smokable material, a plurality of metallic or carbonaceous catalytic particles having a mean average or amode average particle size of less than about 20 microns, and a nitrate or nitrite source; and

combusting the smoking composition, whereby smoke is produced, wherein the smoke comprises a reduced amount of the carcinogenic substance relative to the smokable material alone.

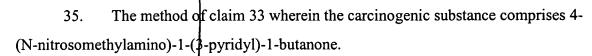
- 33. The method of claim 32 wherein the smokable material comprises tobacco.
- 34. The method of claim 33 wherein the smoke comprises mainstream smoke.

20

5

10





- 36. The method of claim 33 wherein the smoke comprises sidestream smoke.
- 37. The method of claim 36 wherein the carcinogenic substance comprises 4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone.

38 A method of smoking a cigarette with reduced exposure to an undesirable component of cigarette smoke, the method comprising the steps of:

providing the cigarette comprising tobacco, a plurality of metallic or carbonaceous catalytic particles having a mean average or a mode average particle size of less than about 20 microns, and a nitrate or nitrite source; and

combusting the tobacco composition, whereby a cigarette smoke is produced, wherein the cigarette smoke comprises a reduced amount of an undesirable substance.

- 39. The method of claim 38 wherein the cigarette smoke comprises mainstream smoke.
- 40. The method of claim 38 wherein the undesirable substance comprises 4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone.
- 41. The method of claim 38 wherein the cigarette smoke comprises sidestream smoke.
- 42. The method of claim 41 wherein the undesirable substance comprises 4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone.
- 43. The method of claim 38 wherein the undesirable substance comprises a polyaromatic hydrocarbon.
- 44. The method of claim 38 wherein the undesirable substance comprises a tobacco-specific nitrosamine.
- 45. The method of claim 38 wherein the undesirable substance comprises an azaarene.
- 46. The method of claim 38 wherein the undesirable substance comprises carbazole.
- 47. The method of claim 38 wherein the undesirable substance comprises a phenolic compound.

10

5

20

48. The method of claim 47 wherein the phenolic compound comprises phenol or catechol.